

# OIDIUM HEVEÆ

## REPORT ON THE 1935 OUTBREAK OF HEVEA LEAF MILDEW

BY

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During the early part of 1935 Malaya has experienced a return to more normal weather conditions. The easterly winds following the north-east monsoon rains brought with them a period of very bright, dry weather during most of January and the first half of the month of February. A period of drought coming at this early part of the year is considered ideal from the point of view of inducing the fall of old leaves and production of new ones—a natural function observed in all deciduous trees, even in tropical regions, and known locally in connection with rubber agriculture as “wintering.”

As a consequence of this pronounced period of dry weather wintering was early in practically every part of the country, the exceptions being some local coastal areas, especially the Dindings and Matang, where local weather conditions appear to be affected by the close proximity of the Hijau and Bubu mountains, and the Labu—Port Dickson district where again local weather is affected by nearby mountains. It was in these districts from which the earlier report of the presence of the disease arrived. The wintering generally was sharp and even, while in the northern districts refoliation was almost complete before the weather broke. In the central and southern States up to 50 per cent of the trees had obtained their new leaves by the middle of February and it was thought that Malaya would escape the Leaf Mildew disease entirely. However, on the 14th of February a distinct change in the direction of wind occurred and several dull cloudy days with light rains followed, giving opportunity for the fungus to develop and attack the young leaves of the late-wintering trees.

This dull weather continued for several weeks, but intervals of bright sunny weather speeded up the refoliation and prevented the disease from attaining a virulency sufficient to cause any serious defoliation.

As a consequence of this intense and even wintering the new foliage is brighter, more even and more dense while the number of seed pods set is greater throughout the country than has been the case for some years past, and if the return to normal climate is maintained there is every reason to hope that the improvement

in the foliage of rubber trees in Malaya will be continued next year.

Whereas last year the earliest reports of the disease were received in March, this year (1935) reports were received in February, while the greatest number of reports were received during late February and early March when the weather was dull and showery. Later the weather became brighter, with the consequence that few further reports were received except from the coastal districts of Selangor where, owing to the peaty nature of the soil, wintering had been later and more desultory. In practically every case the reports indicated a very mild attack with slight leaf-fall on late-wintering trees only. Reference to Table I and the graph will indicate the time of first-noticed leaf-fall in the various States and the number of reports received during the season.

TABLE I

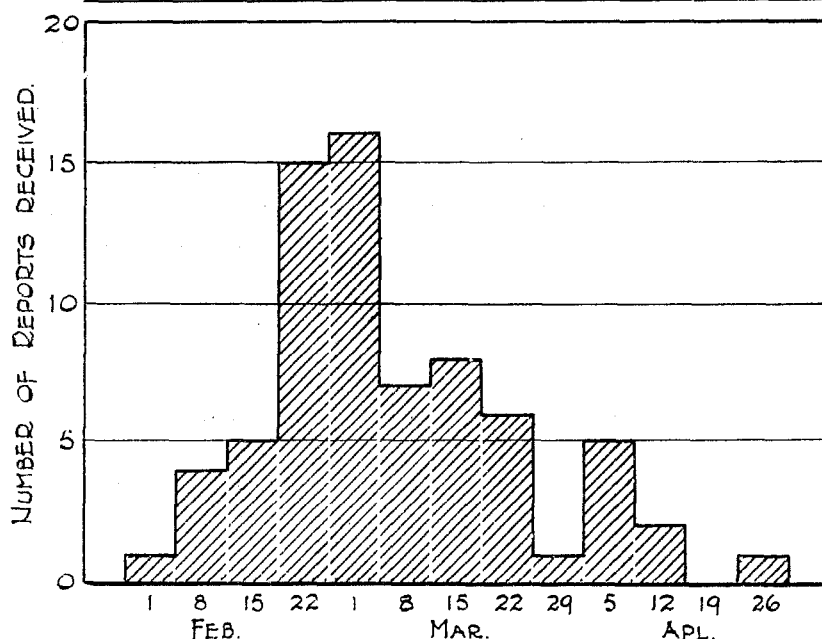
*Oidium Heveæ 1935*

*Reports received per Week from each State.*

	February				March				April					Total
	1—8	8—15	15—22	22—M. 1	M. 1—8	8—15	15—22	22—29	29—Ap. 1	5—12	12—19	19—26	26—M. 6	
Johore				2	7	1	2	2						14
Malacca					1			1						2
Negri Sembilan	1	3	1	5	1		1			1				13
Selangor		1	2	4	2	1	1	2	1	3	2		1	20
Perak				4	3	5	3	1						16
Province Wellesley			1											1
Kedah			1		2									3
Pahang							1			1				2
Total	1	4	5	15	16	7	8	6	1	5	2	0	1	71

During March the writer visited every rubber-growing district west of the main range and full notes were made of the condition of the foliage and extent and virulence of the leaf mildew disease at that time. These notes together with observations and

### NUMBER OF REPORTS RECEIVED PER WEEK PERIOD.



information supplied by estate managers form the basis of the district reports given below.

While on this tour of the districts a disease resembling *Oidium* leaf mildew, but in this instance caused by what was at first thought to be the leaf mite *Tarsonemus translucens*, was present in several districts and in some of the low-lying coastal areas was entirely responsible for the small amount of leaf-fall taking place in the mature rubber. Microscopical investigation showed this small insect to be a Thrips species and not a mite. A report on this new pest of rubber trees is given elsewhere in this *Journal*.

#### JOHORE

The beneficial effects of the early wintering and refoliation were obvious throughout the whole of this State and particularly in the central districts where the trees are well grown; by mid-March the trees had completely refoliated. The top foliage was very good and quite healthy, while in only rare instances was *Oidium* observed and was usually confined to the lower branches of a few backward trees.

The rubber trees nearer the coast are not so vigorous as those in the more central districts and, though the foliage is not so good, little evidence of leaf-fall caused by the disease could be found. Dense planting in some of the small-holdings in coastal areas gives the impression at first of very dense foliage.

North central Johore proved interesting in that, while the older mature rubber had wintered early and obtained a good new foliage, several fields of young rubber and some immature rubber which were observed to be wintering rather late had caught a heavy infection, giving a pale mosaic appearance to the leaves. The spread of the disease in this district may be due to the local rains or mist caused by the close proximity of Mount Ophir (4187 ft).

The occasional fields of rubber seen in the abandoned *lalang* areas around Yang Peng and Ayer Itam are not reported upon here.

#### MALACCA

In the northern part of the territory where, owing to impoverishment of soil, the rubber is poor and stunted, almost 100 per cent early wintering had taken place with the result that a new foliage, free of disease, and in appearance the best seen in the district for many years, developed.

In the more central districts the rubber improves and areas may be found where the foliage is dense and of a glossy dark green colour showing little evidence of mildew, though on closer inspection the lower, heavily-shaded branches were observed to be infected.

The rubber on the undulating country inland around Tampin, Kemuning and Batang Malaka had, following a severe wintering, developed a better and healthier-looking foliage than has been the case for many years. Occasional areas of young rubber which had developed new leaves rather late were seen to be infected with the mildew fungus.

In the southern coastal districts of the territory also a great improvement of the foliage was noticeable. The crown foliage was in almost every case of good colour and free of disease while in the lower branches traces of infection and slight leaf-fall were observed. Contrary to last year the rubber in the coastal areas seemed to be in better condition than in the Jasin district. Around Jasin wintering appeared to have been late and irregular, possibly due to the fact that a secondary wintering in August was experienced in 1934. Most of the late-wintering trees had *Oidium* in the lower and middle branches but only a slight leaf-fall was evident. This situation is possibly due to the proximity of Mount Ophir.

The Asahan district appears to have been protected by the same hills and had wintered at an extremely early period and according to information many of the trees developed new leaf in January. The district is now practically free of leaf-fall and

on only rare occasions was the fungus found at all. The foliage is a great improvement on last year.

#### NEGRI SEMBILAN

The coastal district of this State had a varying type of foliage due apparently to variations in soil nutrition and water supply. Some of the gravel and quartz soils bore rubber of rather poor foliage in which a considerable amount of disease and leaf-fall was present caused both by *Oidium* and by *Thrips*. Here again a secondary wintering was experienced during the drought of August last. A great improvement was noticeable further south where an early and even wintering had resulted in an excellent foliage. Occasional patches on gravelly soils were seen to be affected by the mildew disease but in very few cases was leaf-fall observed. Similarly in the Lukut area, in stunted rubber on badly-drained flats, the disease was in evidence.

In Port Dickson, Linggi and Sengkang districts some fields were observed to be as bad as last year, due to a late desultory wintering. A secondary wintering in August last again appeared to be responsible.

A considerable improvement was observed more inland and also towards the Lubok China districts where such leaf-fall as was observed was found to be due to *Thrips*.

Inland, Siliau & Rantau districts had experienced a severe early wintering on the undulating and hilly land with a consequent good foliage. On the flats several fields were observed to be infected sufficiently to cause leaf-fall from the middle and lower branches. Seremban, Labu and Nilai districts showed a very good foliage with only occasional late-wintering trees carrying a light infection with slight leaf-fall from the lower branches.

In these districts a considerable amount of sulphur dusting had been carried out, but the effects of the disease have been so slight this year that no visible improvement to the foliage had been obtained by four weekly rounds of sulphur dusting. Throughout these districts *Thrips* were observed to be active on the new shoots and whorls of leaves in both mature and young areas. In the Nilai district some small areas of badly diseased foliage were observed which may have been due to local conditions affecting the wintering and refoliation.

In the Gemencheh district an early even wintering had in nearly every case led to a good healthy crown of foliage, whereas in Johol considerable areas of late-wintering trees had been attacked but even so the foliage showed a great improvement on last year.

## SELANGOR

The rubber generally on the higher ground in this State had a very early and intense wintering, with the result that much new foliage was obtained before the fine weather broke in the middle of February. In the more fertile, watered valleys wintering was not so early and in such areas the late-wintering trees could be observed in late March to be suffering from a mild attack of *Oidium* in the lower branches.

In the coastal districts the wintering was not so severe and infection, causing a scarcely noticeable leaf-fall, was observed, together with a fall of young leaf caused by *Thrips* sp.

The southern coastal district contains areas where the foliage looks poor on account of poor soil conditions.

Further inland around Kajang, Kuala Lumpur and Kuala Kubu the wintering was generally very early but, owing to the presence of mists around the foothills, the late-wintering trees were attacked in March and early April. Even so the foliage this year can be said to be more dense and of a deeper and brighter colour than in 1934.

Further north towards Tanjong Malim the improvement in foliage was maintained; trees on the hilly land wintering early had developed an excellent foliage but again those in the valleys were suffering a mild attack, actual leaf-fall being confined to the lower branches of late-wintering trees.

The northern portion of Selangor also showed a general improvement though in several places the activity of *Thrips* pest was noted.

It is of note that this year the greatest number (20) of reports were received from Selangor, but it is gratifying to note that in most cases the outbreak was described as of a mild nature confined to small areas of the State. This is borne out by the great increase in number of seed pods which are evident upon the mature rubber.

## PERAK

The trees in the district north of Tanjong Malim had experienced a severe early wintering and developed a good foliage by the end of March; Trolak generally showed a great improvement on last year and the quality of the foliage seemed to vary with suitability of soils. Contrary to last year there were scarcely any signs of leaf-fall due to *Oidium Heveae*.

The undulating ground of Sungkai bore rubber of heavy foliage and was practically free of disease.

Further north from Bidor throughout the Kinta district the quality of the foliage varied with that of the soil. Trees on the

hills bearing excellent foliage practically free of disease were in evidence while on the alluvial flats the foliage though poor was healthy. Other occasional areas on rich flat land showed an excellent foliage, but new shoots and whorls of leaves were found to be infected.

The trees in the Kinta district as a whole showed a great improvement in foliage over previous years.

The foliage in the Ipoh-Chemor district though better than last year was, owing to the alluvial nature of the soil, only of medium density. Very little evidence of disease could be found, even the young clearings were looking very healthy.

Sungei Siput and Padang Rengas districts showed a much better foliage which appeared to have escaped attack completely although new shoot growth proved on close examination to be infected. Here also an early, severe wintering had taken place.

North Perak, owing to the configuration of the land showed extremely variable foliage. On one side of a hill the trees had wintered early and obtained an excellent foliage while on the other side late wintering and consequent attack of leaf mildew had occurred. Further variation in quality of foliage was due directly to soil conditions, the substratum in some places being solid rock.

Leaving the hills to the territory west of Gunong Semanggol and Gunong Bubu more normal conditions were found and a gradual improvement had taken place until on the flat peaty soils a very heavy dense canopy of foliage was general.

Further south the wintering had been upset by local climatic effects due to the proximity of G. Bubu. Wintering was patchy and, though some areas had developed a fairly good foliage, others showed a heavy infection with resultant heavy leaf-fall. This district was the worst observed during the tour. A gradual improvement took place further south in the Bruas district, but wintering had been patchy and some 5 to 10 per cent of trees in the early stages of refoliation were observed to be heavily infected. The improvement was continued in the rubber in Sitiawan, where wintering was more even and complete, though in many cases the lower branches had been attacked and suffered considerable leaf-fall. Even so the canopy was somewhat better than that of last year.

Lower Perak, which has rarely shown any evidence of leaf-fall, has this year remained practically free of mildew disease.

#### PROVINCE WELLESLEY

Conditions here were similar to those of last year and though the foliage was said to be slightly heavier a slight attack of leaf

mildew had been experienced in mid-February, but a complete recovery had taken place in both the old and the young rubber. At the time of the visit slight infection of new whorls of leaves was noted.

On the poorer hilly land near Bakap some areas of poor rubber were observed to carry a moderate infection causing mild leaf-fall. Further inland the rubber is planted on rising ground intersected by padi lands and on the whole was in good condition and showed no signs of having been attacked.

#### KEDAH

In South Kedah the Terap and Serdang districts appeared to have escaped attack completely. Difficulty was experienced in finding the slightest trace of the fungus even on the new shoot foliage. The conditions of the foliage varied entirely with the general cultural conditions.

Further south towards Bandar Bahru, though the upper foliage was good, distinct signs of infection and leaf-fall in the lower branches was noted.

In the Kulim district the trees in both large estate and small-holdings had a dense canopy of deep green foliage. Secondary growth on lower branches was attacked by the *Oidium* fungus. Similarly in the Lunas district early wintering had resulted in excellent foliage which appeared to vary only according to the soil conditions.

Around Padang Serai early wintering had resulted in a strong dark green foliage in most of the rubber areas. Secondary growth appeared to be attacked by both *Oidium* and Thrips. Kuala Ketil and Lubok districts also showed a great improvement on the foliage of last year, though a few late-wintering trees had been caught by the disease following the break in the weather just after the middle of February. The young rubber trees, late wintering trees, and the new growth on refoliated trees were here shown to be affected by both *Oidium Heveae* and Thrips.

The foliage in the Kuala Muda and Sungei Patani districts was considered to be some 50 per cent better than in the previous two years; early wintering of the trees on the hard soils enabled them to escape attack during refoilation, resulting in good well-shaped dark green foliage. Grass-covered fields invariably bore an inferior foliage.

The improvement continued further north to Gurun, the most northerly point visited. Here the foliage was, as usual, very heavy and as a result of the excellent shade *Oidium*, Thrips, spider and *Helminthosporium* leaf spot were observed in the new growths